

Remarks

Claims 1-7 and 8-30 remain in the application. Claim 8 is hereby canceled without prejudice. Claims 1, 9, 11, 12, 13, 14, 15, 16, 17, and 20 are hereby amended. No new matter is being added.

Claim Rejections

Claims 14, 20-21, 24-26, and 29 were rejected under 35 U.S.C. 102(b) as being anticipated by Weiler et al (USP 5,936,318). This rejection is traversed with respect to the claims as now amended.

Claims 1-7, 11-13, 15-19, 27-28, and 30 were rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art (AAPA) in view of Weiler et al. This rejection is traversed with respect to the claims as now amended.

Claims 8-10 were rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art (AAPA) in view of Weiler et al, further in view of Toyomura (USP 4,486,759). This rejection is traversed with respect to the claims as now amended.

The following discussion groups the claims by independent claim. The first group discussed includes claims 1-7, 9-13 and 30. The second group discussed includes claims 14-19. The third group discussed includes claims 20-29.

Claims 1-7, 9-13 and 30

Amended independent claim 1 now recites as follows.

1. A system for power distribution of direct current (DC) power over twisted pair cabling to network devices, the system comprising:
 - a plurality of ethernet switches each having an internal power supply and a plurality of ports grouped into a plurality of banks for connecting to the network devices via said twisted pair cabling;
 - an external power supply having a plurality of output ports for connecting to the ethernet switches,wherein the external power supply communicates power available to the ethernet switches,

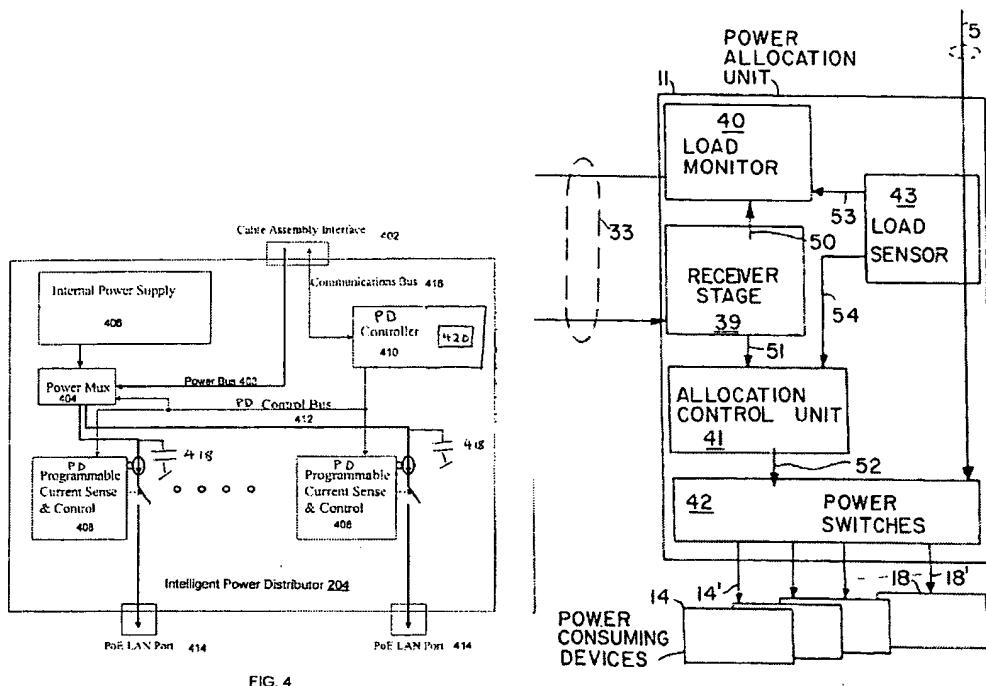
wherein each ethernet switch determines amounts and priority levels of power for the network devices connected thereto, sums together the amounts at each priority level, determines additional amounts and priority levels of power required beyond the internal power supply capability, and sends a power request to the external power supply,
wherein the external power supply allocates power to the ethernet switches depending on the power requests received, and wherein each ethernet switch includes a power multiplexer which is controllable so as to switch power from the internal power supply to one or more of the banks of ports and which is also controllable so as to switch power from the external power supply to one or more of the banks of ports.

(Emphasis added.)

As recited above, amended claim 1 now specifies “**each ethernet switch determines amounts and priority levels of power for network devices connected thereto.**” Applicant respectfully submits that Weiler does not disclose or teach this limitation as **Weiler does not pertain to ethernet switches.**

Claim 1 further recites that each ethernet switch “**determines additional amounts and priority levels of power required beyond an internal supply capability.**” Applicant respectfully submits that Weiler does not disclose or teach this limitation as **the power allocation unit 11 of Weiler does not include any internal power supply, but rather it only receives external power via strands 5.**

To illustrate this point, the intelligent power distributor **204** in FIG. 4 of the present application and the power allocation unit **11** in FIG. 2 of Weiler are reproduced below.



(FIG. 4 of the present application)

(from FIG. 2 of Weiler et al)

The left drawing (FIG. 4 of the present application) shows an internal power supply **406** in the intelligent power distributor (the claimed ethernet switch) **204**. In contrast, the right drawing (from FIG. 2 of Weiler et al) shows a power allocation unit **11** with only the power strands **5** and no internal power supply.

Regarding Toyomura (USP 4,486,759), Toyomura teaches a switch which switches **between** internal and external power supplies. (See Abstract of Toyomura.) However, Toyomura does not disclose or teach the claimed step of “determining additional amounts and priority levels of power required beyond a capability of an internal supply of each ethernet switch.”

Furthermore, claim 1 recites that each ethernet switch “**sends a power request to the external power supply**” and that “**the external power supply allocates power to the ethernet switches depending on the power requests received.**” Applicant respectfully submits that these limitations are not disclosed or taught by Weiler et al. In addition, applicant respectfully submits that applicant’s admitted prior art (AAPA) and Toyomura also do not disclose or teach these claim limitations.

In the Office Action, an assertion is made that “AAPA teaches that the external power supply communicates power available to the network switches, each network switch sends a power request to the external power supply, and the external power supply allocates power to the network switches depending on the power requests received.” Citation is made to line 16 of page 1. (See page 9 of the Office Action in relation to claim 15.) This assertion is respectfully traversed. Lines 14-19 of page 1, under Description of the Background Art, recites specifically as follows.

Power over LAN™ or Power over Ethernet, is a new technology that enables DC power to be supplied to Ethernet data terminals over ordinary local area network (LAN) cabling such as Category 5 cabling. This technology enables the terminals, termed powered devices (PDs), to receive their operating power over the same Ethernet LAN connection that they use for data communication.

As seem above, the citation merely discusses supplying DC power to powered devices (i.e. to network devices) over an Ethernet LAN connection. **Power requests from network switches to an external power supply are not mentioned. In addition, there is no mention of allocation of power to the network switches depending on the power requests received.**

Even furthermore, claim 1 recites that “**each ethernet switch includes a power multiplexer which is controllable so as to switch power from the internal power supply to one or more of the banks of ports and which is also controllable so as to switch power from the external power supply to one or more of the banks of ports.**” Applicant respectfully submits that these limitations are not disclosed or taught by Weiler et al. The power switch 42 of Weiler et al is not disclosed or taught as being controllable so as to switch power from an internal power supply to one or more banks of ports and also controllable so as to switch power from an external power supply to one or more banks of ports. In addition, applicant respectfully submits that applicant’s admitted prior art (AAPA) and Toyomura also do not disclose or teach these claim limitations.

Therefore, for at least the above-discussed reasons, applicant respectfully submits that claim 1 is now patentably distinguished over Weiler et al, Toyomura, AAPA, and combinations thereof.

Claims 2-7, 9-13, and 30 depend from claim 1. Hence, applicant respectfully submits that claims 2-7, 9-13, and 30 are now patentably distinguished over Weiler et al, Toyomura, AAPA, and combinations thereof, for at least the same reasons discussed above in relation to claim 1.

More particularly, regarding claims 2 and 3, applicant respectfully traverses the assertion that item 108 of FIG. 1 of applicant's specification is a serial cable. Page 3, line 33 through page 4, line 3 recites as follows.

The conventional cable assembly **108** typically provides power and return wires. For power-sharing purposes, a sense-signal line may be provided. The sense signal may comprise a low-current analog signal generated using low-impedance circuitry. The sense signal is an indication of the load due to the associated power distributor **104**.

As seen above, the specification of the present application describes cable 108 as including power and return wires and a sense-signal line. There is no mention of a "serial cable."

Regarding claim 11, applicant respectfully traverses the official notice that "arbitration between requests from different devices is well known in the art." Applicant kindly requests a citation in the power distribution area that uses arbitration between power requests. Applicant further traverses the assertion that "[o]ne of ordinary skill in the art would have been motivated to have arbitration, so that the system guarantees all of the switches to be allocated with power in their respective slot of arbitration." Applicant respectfully submits that this assertion is being made with the benefit of hindsight based on the present disclosure. Hence, applicant respectfully submits that the use of arbitration of power requests is inventive over the prior art.

Regarding claims 12 and 13, applicant respectfully traverses the assertion that "[i]t would have been obvious for one ordinary skill in the art at the time the invention was made to have master/slave arbitration or peer-to-peer arbitration depending on the applicability of the situation...." Applicant respectfully submits

that this assertion is being made with the benefit of hindsight based on the present disclosure. Hence, applicant respectfully submits that the use of master/slave arbitration of power requests and the use of peer-to-peer arbitration of power requests are both inventive over the prior art.

Claims 14-19

Amended independent claim 14 now recites as follows.

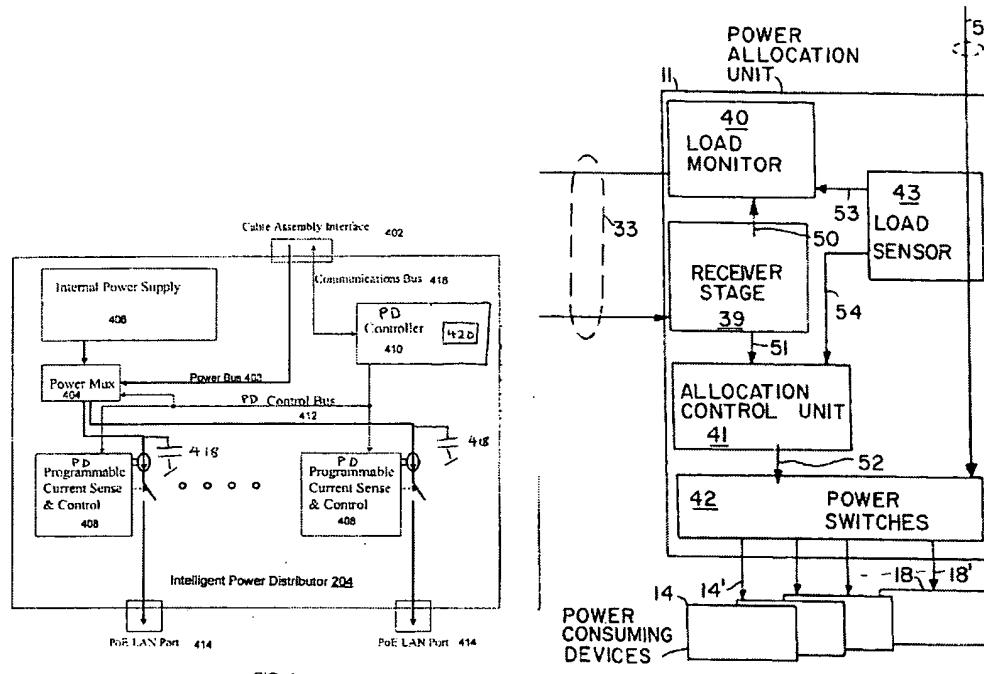
14. A method of power distribution of direct current (DC) power over twisted pair cabling to network devices, the method comprising:
determining amounts and priority levels of power for the network devices connected via said twisted pair cabling to each ethernet switch of a plurality of ethernet switches;
summing together the amounts at each priority level at each ethernet switch;
determining additional amounts and priority levels of power required beyond a capability of an internal power supply of each ethernet switch; and
communicating a power request to an external power supply.

(Emphasis added.)

As recited above, amended claim 14 now specifies "**determining amounts and priority levels of power for network devices connected via said twisted pair cabling to each ethernet switch of a plurality of ethernet switches.**" Applicant respectfully submits that Weiler does not disclose or teach this limitation as **Weiler pertains to neither twisted pair cabling nor ethernet switches.**

Claim 14 also recites the step of "**determining additional amounts and priority levels of power required beyond a capability of an internal supply of each ethernet switch.**" Applicant respectfully submits that Weiler does not disclose or teach this limitation as **the power allocation unit 11 of Weiler does not include any internal power supply, but rather it only receives external power via strands 5.**

To illustrate this point, the intelligent power distributor **204** in FIG. 4 of the present application and the power allocation unit **11** in FIG. 2 of Weiler are reproduced below.



(FIG. 4 of the present application)

(from FIG. 2 of Weiler et al)

The left drawing (FIG. 4 of the present application) shows an internal power supply **406** in the intelligent power distributor (the claimed ethernet switch) **204**. In contrast, the right drawing (from FIG. 2 of Weiler et al) shows a power allocation unit **11** with only the power strands **5** and no internal power supply.

Regarding Toyomura (USP 4,486,759), Toyomura teaches a switch which switches **between** internal and external power supplies. (See Abstract of Toyomura.) However, Toyomura does not disclose or teach the claimed step of "determining additional amounts and priority levels of power required beyond a capability of an internal supply of each ethernet switch."

Furthermore, claim 14 recites the step of "**communicating a power request to an external power supply.**" Applicant respectfully submits that this

limitation is not disclosed or taught by Weiler et al. In addition, applicant respectfully submits that applicant's admitted prior art (AAPA) and Toyomura also do not disclose or teach this claimed step.

In the Office Action, an assertion is made that "AAPA teaches that the external power supply communicates power available to the network switches, each network switch sends a power request to the external power supply, and the external power supply allocates power to the network switches depending on the power requests received." Citation is made to line 16 of page 1. (See page 9 of the Office Action in relation to claim 15.) This assertion is respectfully traversed. Lines 14-19 of page 1, under Description of the Background Art, recites specifically as follows.

Power over LANTM or Power over Ethernet, is a new technology that enables DC power to be supplied to Ethernet data terminals over ordinary local area network (LAN) cabling such as Category 5 cabling. This technology enables the terminals, termed powered devices (PDs), to receive their operating power over the same Ethernet LAN connection that they use for data communication.

As seem above, the citation merely discusses supplying DC power to powered devices (i.e. to network devices) over an Ethernet LAN connection. **Power requests from network switches to an external power supply are not mentioned. In addition, there is no mention of allocation of power to the network switches depending on the power requests received.**

Therefore, for at least the above-discussed reasons, applicant respectfully submits that claim 14 is now patentably distinguished over Weiler et al, Toyomura, AAPA, and combinations thereof.

Claims 15-19 depend from claim 14. Hence, applicant respectfully submits that claims 15-19 are now patentably distinguished over Weiler et al, Toyomura, AAPA, and combinations thereof, for at least the same reasons discussed above in relation to claim 14.

More particularly, regarding claim 15, applicant respectfully traverses the assertion that the "AAPA teaches that the external power supply communicates power available to the network switches, each network switch sends a power request to the external power supply, and the external power supply allocates

power to the network switches depending on the power requests received.” Citation is made to line 16 of page 1. (See page 9 of the Office Action in relation to claim 15.) Lines 14-19 of page 1, under Description of the Background Art, recites specifically as follows.

Power over LAN™ or Power over Ethernet, is a new technology that enables DC power to be supplied to Ethernet data terminals over ordinary local area network (LAN) cabling such as Category 5 cabling. This technology enables the terminals, termed powered devices (PDs), to receive their operating power over the same Ethernet LAN connection that they use for data communication.

As seen above, the citation merely discusses supplying DC power to powered devices (i.e. to network devices) over an Ethernet LAN connection. **Power requests from network switches to an external power supply are not mentioned.** In addition, **there is no mention of allocation of power to the network switches depending on the power requests received.**

Regarding claim 16, applicant respectfully traverses the assertion that item 108 of FIG. 1 of applicant's specification is a serial cable. Page 3, line 33 through page 4, line 3 recites as follows.

The conventional cable assembly **108** typically provides power and return wires. For power-sharing purposes, a sense-signal line may be provided. The sense signal may comprise a low-current analog signal generated using low-impedance circuitry. The sense signal is an indication of the load due to the associated power distributor **104**.

As seen above, the specification of the present application describes cable 108 as including power and return wires and a sense-signal line. There is no mention of a “serial cable.”

Regarding claim 17, applicant respectfully traverses the official notice that “arbitration between requests from different devices is well known in the art.” Applicant kindly requests a citation in the power distribution area that uses arbitration between power requests. Applicant further traverses the assertion that “[o]ne of ordinary skill in the art would have been motivated to have arbitration, so that the system guarantees all of the switches to be allocated with

power in their respective slot of arbitration.” Applicant respectfully submits that this assertion is being made with the benefit of hindsight based on the present disclosure. Hence, applicant respectfully submits that the use of arbitration of power requests is inventive over the prior art.

Regarding claims 18 and 19, applicant respectfully traverses the assertion that “[i]t would have been obvious for one ordinary skill in the art at the time the invention was made to have master/slave arbitration or peer-to-peer arbitration depending on the applicability of the situation....” Applicant respectfully submits that this assertion is being made with the benefit of hindsight based on the present disclosure. Hence, applicant respectfully submits that the use of master/slave arbitration of power requests and the use of peer-to-peer arbitration of power requests are both inventive over the prior art.

Claims 20-29

Amended independent claim 20 now recites as follows.

20. A method of distributing direct current (DC) power to network devices over twisted pair cabling, the method comprising:
associating an amount and priority level of power for each device connected via said twisted pair cabling to a port of a network switch;
maintaining in the switch a table of the amount and priority level for each switch port;
summing together the amounts of power for the devices connected to the network switch;
determining additional amounts and priority levels of power required beyond a capability of an internal power supply in the network switch;
communicating a power request to an external power supply; and
using the table to allocate available power to higher priority devices when insufficient power is available to fully power all of the connected devices.

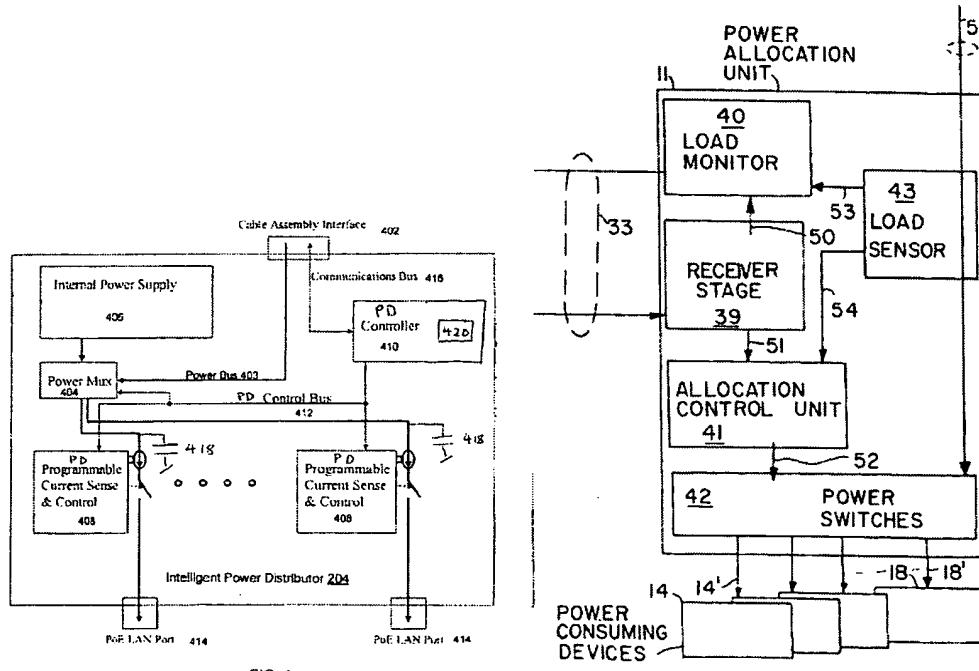
(Emphasis added.)

As recited above, amended claim 20 now specifies “**associating an amount and priority level of power for each device connected via said twisted pair cabling to a port of a network switch.**” Applicant respectfully

submits that Weiler does not disclose or teach this limitation as **Weiler pertains to neither twisted pair cabling nor network switches.**

Claim 20 also recites the step of “**determining additional amounts and priority levels of power required beyond a capability of an internal supply in the network switch.**” Applicant respectfully submits that Weiler does not disclose or teach this limitation as **the power allocation unit 11 of Weiler does not include any internal power supply, but rather it only receives external power via strands 5.**

To illustrate this point, the intelligent power distributor 204 in FIG. 4 of the present application and the power allocation unit 11 in FIG. 2 of Weiler are reproduced below.



(FIG. 4 of the present application)

(from FIG. 2 of Weiler et al)

The left drawing (FIG. 4 of the present application) shows an internal power supply **406** in the intelligent power distributor (the claimed ethernet switch) **204**.

In contrast, the right drawing (from FIG. 2 of Weiler et al) shows a power allocation unit 11 with only the power strands 5 and no internal power supply.

Regarding Toyomura (USP 4,486,759), Toyomura teaches a switch which switches **between** internal and external power supplies. (See Abstract of Toyomura.) However, Toyomura does not disclose or teach the claimed step of “determining additional amounts and priority levels of power required beyond a capability of an internal supply of each ethernet switch.”

Furthermore, claim 20 recites the step of “**communicating a power request to an external power supply.**” Applicant respectfully submits that this limitation is not disclosed or taught by Weiler et al. In addition, applicant respectfully submits that applicant’s admitted prior art (AAPA) and Toyomura also do not disclose or teach this claimed step.

In the Office Action, an assertion is made that “AAPA teaches that the external power supply communicates power available to the network switches, each network switch sends a power request to the external power supply, and the external power supply allocates power to the network switches depending on the power requests received.” Citation is made to line 16 of page 1. (See page 9 of the Office Action in relation to claim 15.) This assertion is respectfully traversed. Lines 14-19 of page 1, under Description of the Background Art, recites specifically as follows.

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As seem above, the citation merely discusses supplying DC power to powered devices (i.e. to network devices) over an Ethernet LAN connection. **Power requests from network switches to an external power supply are not mentioned.** In addition, **there is no mention of allocation of power to the network switches depending on the power requests received.**

Therefore, for at least the above-discussed reasons, applicant respectfully submits that claim 20 is now patentably distinguished over Weiler et al., Toyomura, AAPA, and combinations thereof.

Claims 21-29 depend from claim 20. Hence, applicant respectfully submits that claims 21-29 are now patentably distinguished over Weiler et al., Toyomura, AAPA, and combinations thereof, for at least the same reasons discussed above in relation to claim 20.

More particularly, regarding claims 27-28, applicant respectfully traverses the assertion that the “One of ordinary skill in the art would have been motivated to have IP-enabled telephone device or wireless access point so that communication devices are always active in the system, which is desirable in airline system.” (See page 10 of the Office Action in relation to claims 27-28.) Applicant respectfully submits that this assertion is being made with the benefit of hindsight based on the present disclosure.

Conclusion

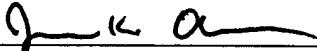
For the above-discussed reasons, applicant believes that claims 1-7 and 8-30, as they are hereby amended, are now patentably distinguished over the prior art. Favorable action is respectfully requested.

If for any reason an insufficient fee has been paid, the Commissioner is hereby authorized to charge the insufficiency to Deposit Account No. 08-2025.

Respectfully Submitted,

Dated: July 25, 2006


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